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EVALUATION OF THE SOUTHERN PINE BEETLE
INFESTATIONS ON THE NATIONAL FORESTS OF ALABAMA

U. S. FOREST SERVICE
Pineville, Louisiana

U.S. DEPARTMENT OF AGRICULTURE - FOREST SERVICE
SOUTHEASTERN AREA, STATE AND PRIVATE FORESTRY
FOREST INSECT & DISEASE MANAGEMENT GROUP

EVALUATION OF THE SOUTHERN
PINE BEETLE INFESTATIONS ON
THE NATIONAL FORESTS OF ALABAMA

by

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INTRODUCTION

Aerial photographic surveys were conducted on all the National Forests of Alabama followed by subsequent ground examinations. Two months later random aerial sketch map survey and ground examinations were again conducted on all Districts. The photographic survey covered 1,089,543 acres, and the sketch map survey was conducted on 1,073,915 acres. The Forest Pest Management Group conducted the surveys to determine the status and trend of southern pine beetle populations on the Talladega, Bankhead, and Tuskegee National Forests.

The southern pine beetle infestations in Alabama are part of a southwide outbreak now involving 13 states. The current outbreak was first observed on the Talladega National Forest in the spring of 1972 and on the Bankhead and Tuskegee National Forests in the summer of 1972.

METHODS

A 15 percent aerial photographic survey was performed on all National Forests. A portion of the spots detected during the aerial phase of the evaluation were examined on the ground to confirm the cause of mortality and the percent of active spots.

Two months later a random sketch map survey was again conducted on all districts of the Talladega and Bankhead National Forests. The survey was also followed by ground examination of the spots.

In addition, each District Office was contacted by telephone and/or in person at least once, and in most cases twice, to discuss the general southern pine beetle situation, past and current, as they viewed it.

TECHNICAL INFORMATION

Insect - Southern pine beetle, *Dendroctonus frontalis*, Zimm.

Hosts - The southern pine beetle will attack all species of southern yellow pine. However, loblolly pine, *Pinus taeda* L. and shortleaf pine, *P. echinata* Mill., are the preferred hosts.

Type of Damage - Death of the tree is the result of cambial mining by the southern pine beetle as it constructs its gallery. The beetle also introduces the blue stain fungi, *Ceratocystis* spp., which slows down or blocks conduction of water in the stem.

Life cycle of the beetle - The beetles attack, bore through the bark, and construct a winding gallery in the cambium. Eggs are deposited in niches along the sides of the galleries. The eggs hatch into whitish grubs that further mine the cambium and then construct cells in the bark for pupation. The callow adults then mine through the bark to emerge. The complete life cycle takes about a month during the summer and as many as seven generations may be produced in a year.

RESULTS AND DISCUSSION

The photographic survey showed low numbers of spots. The spots that were detected were mainly single trees. Only one spot larger than 20 trees was detected.

Due to the low numbers of spots detected on the photographic survey and subsequent ground check information, it was decided that a second sketch map survey and ground examination would be conducted to reinforce and substantiate the existing data.

Of the spots that were examined on the ground, 43 percent of the spots were southern pine beetle related. Half of these were inactive. The remaining 57 percent of the spots not related to southern pine beetle were attributed to *Ips* engraver beetles, black turpentine beetles or lightning-struck trees that were later attacked by those beetles.

Tables 1-4 summarize the results of this evaluation.

The following is a narrative discussion of the southern pine beetle situation on each district.

Bankhead National Forest

Bankhead District - According to aerial survey data, there are 1.5 spots/M acres host type (h.t.) and 5.1 red and fading trees/M acres h.t. However, ground check data revealed only .2 infested trees/M acres h.t. This is a decrease from 1.0 in 1974. Only 14 percent of the spots checked were actively infested with southern pine beetle.

District personnel indicated very little activity had been observed. Most spots detected were inactive. Active spots were small, usually three to four trees.

Black Warrior District - The greatest southern pine beetle activity occurs on the Black Warrior District. Based on aerial survey data, there are 3.6 spots/M acres h.t. and 13.7 reds and faders/M acres h.t. Ground check data showed 5.5 infested trees/M acres h.t. This shows an increase from the estimated 1.9 spots/M acres and 2.7 infested trees/M acres h.t. reported in 1974. Of the spots checked, 57 percent were actively infested with southern pine beetle.

District personnel reported that spots have been small, and although there has been some timber salvaged, sales have been down. Sales have increased slightly since the evaluation was made.

Tuskegee National Forest

Tuskegee District - The aerial photographic survey indicated minimal southern pine beetle activity on the District. There are an estimated .7 spots/M acres h.t. This compares with 6.4 spots/M acres h.t. detected in 1974. No spots other than single trees were observed. This District was not ground checked due to the low number of spots detected.

District personnel reported that there had been little activity during the summer. The only major spot reported occurred in a 15-year old plantation. Sixty-eight CCF of pulpwood was removed.

Talladega National Forest

Talladega District - Most activity on the Talladega National Forest occurred on this District. Aerial survey data indicates an estimated 2.3 spots and 7.3 reds and faders/M acres h.t. Ground check data

estimates there are 1.8 infested trees/M acres. When compared to the 1974 report, there was a decrease in both the numbers of spots and the infested trees/M acres h.t. Of the spots checked, 25 percent were actively infested.

Reports from District personnel verified there were very few actively infested spots at the time of the survey and evaluation.

Shoal Creek District - Based on aerial survey data, there are only 1.0 spots and 1.3 red and fading trees/M acres h.t. There was a range of spot size from 1-4 trees. Sixty-six percent of the spots that were ground checked were actively infested. This is .6 infested trees/M acres h.t. There was an estimated 58 infested trees within the survey boundary. Data is similar to that reported in 1974.

According to District personnel, most larger spots in the area were on private land. The largest spot on the district had occurred in storm-damaged timber. Few large spots had occurred and there were none reported at the time of the evaluation.

Oakmulgee District - According to aerial survey data, there are 1.9 spots/M acres h.t. as compared to 2.7 in 1974. The average spot size is less than two trees. There was an estimated 3.7 red and fading trees/M acres h.t. However, information compiled on the ground examination shows there are only .2 infested trees/M acres h.t. and only 32 infested trees within the survey boundary. Approximately eight percent of the spots checked were actively infested with southern pine beetles.

Overall, southern pine beetle activity on the National Forests of Alabama has been low. Based on survey data, only the Talladega and Black Warrior Districts had more than two spots/M acres h.t., 2.3 and 3.6 respectively. There was an estimated 1.8 infested trees/M acres h.t. on the Talladega District and 5.5 infested trees/M acres h.t. on the Black Warrior District. All other districts had less than one infested tree per M acres host type. Likewise, only the Talladega and Black Warrior Districts were the only districts estimated to have more than 100 infested trees within the survey boundary.

All districts on the Talladega and Tuskegee National Forests showed a decrease in both the number of spots/M acres h.t. and the number of infested trees/M acres h.t. when compared to the 1974 evaluations. The Bankhead District showed an increase in the number of spots/M acres h.t., but a decrease in numbers of infested trees. Only the

Black Warrior District showed an increase in both the number of spots and number of infested trees/M acres h.t. over those reported in 1974.

RECOMMENDATIONS

It is recommended that because of low populations, Southern Pine Beetle Projects be terminated on the following districts:

Talladega National Forest - Talladega District
Shoal Creek District
Oakmulgee District

Bankhead National Forest - Bankhead District

Tuskegee National Forest - Tuskegee District

It is recommended that the Southern Pine Beetle Project be continued on the Black Warrior District, Bankhead National Forest. This District should continue suppression measures for southern pine beetle in accordance with the Southern Pine Beetle Control Plan for the National Forests of Alabama and FSM 5250.

REFERENCES

- Ragenovich, I. R. and J. F. Denniston. 1974. Evaluation of southern pine beetle infestations on the Talladega Division, Talladega National Forest, Alabama. U.S.D.A. For. Serv., SA, S&PF, Forest Pest Mgmt. Group, Rept. No. 75-2-1.
- Ragenovich, I. R., L. M. Moore, J. F. Denniston, and E. H. Boddie. 1974. Evaluation of the southern pine beetle infestation on the Bankhead National Forest, Alabama. U.S.D.A., For. Serv., SA, S&PF, Forest Pest Mgmt. Group. Rept No. 75-2-3.
- Terry, J. R., N. Churchill, and J. F. Denniston. 1974. Evaluation of southern pine beetle infestations on the Tuskegee National Forest, Alabama. U.S.D.A., For. Serv., SA, S&PF, Forest Pest Mgmt. Group. Rept. No. 74-2-11.
- Terry, J. R. and L. M. Moore. 1974. Evaluation of southern pine beetle infestations on the Oakmulgee District, Talladega National Forest, Alabama. U.S.D.A., For. Serv., SA, S&PF, Forest Pest Mgmt. Group. Rept. No. 75-2-2.

Table 1. Summary of the results of the southern pine beetle evaluations conducted on the Bankhead and Tuskegee National Forests, Alabama, 1975.

	Ownership		
	Bankhead National Forest Bankhead R.D.	Black Warrior R.D.	Tuskegee National Forest Tuskegee R.D.
Results compiled from data collected during the aerial phase of the evaluation			
Survey type	Photographic	Photographic	Photographic
Percent survey	15%	15%	15%
Acreage surveyed	180,683	168,232	15,628
Total acres susceptible host type	112,023	104,304	9,689
Total number of spots within survey boundary	167	380	7
Spots per M acres host type	1.5	3.6	0.7
Average spot size (trees)	3.4	4.7	1
Range of spot size (trees)	1-50	1-20	1
Reds and faders per M acres host type	5.1	13.7	0.7
Results compiled from data collected during the ground and aerial phases of the evaluation			
Infested trees per M acres	.2	5.5	1/
Total number infested trees within survey boundary	29	131.0	
Total volume of infested trees (MBF)	1.5	8.4	
Total volume of infested trees (CCF)	--	11.9	
Percent of spots infested	14%	57%	

1/ Ground check data not available.

Table 2. Summary of the results of the southern pine beetle evaluations conducted on the Talladega National Forest, Alabama, 1975

	Ownership		
	Talladega R.D.	Shoal Creek R.D.	Oakmulgee R.D.
Results compiled from data collected during the aerial phase of the evaluation			
Survey type	Photographic	Photographic	Photographic
Percent survey	15%	15%	15%
Acreage surveyed	210,000	195,000	320,000
Total acres susceptible host type	97,500	95,596	217,600
Total number of spots within survey boundary	227	100	413
Spots per M acres host type	2.3	1.0	1.9
Average spot size (trees)	3.1	1.3	1.9
Range of spot size (trees)	1-15	1-4	1-18
Reds and faders per M acres host type	7.3	1.3	3.7
Results compiled from data collected during the ground and aerial phases of the evaluation			
Infested trees per M acres	1.8	0.6	0.2
Total number infested trees within survey boundary	177	58	32
Total volume of infested trees (MBF)	13.5	8.9	--
Total volume of infested trees (CCF)	--	--	2.6
Percent of spots infested	25%	66%	8%

Table 3. Summary of the aerial data - Southern Pine Beetle Evaluation on the National Forests of Alabama, Nov. 1975^{1/}

Ownership	Singles	Spot Size --- Trees				Total Spots:Trees	Avg. mult. Tree Spot Size ^{2/}
		2-5 Spots:Trees	6-20 Spots:Trees	21-50 Spots:Trees	51+ Spots:Trees		
Bankhead N.F.							
Bankhead R.D.	127	27:73	6:40	7:334	0:0	167:574	11.0
Black Warrior R.D.	147	167:594	67:687	0:0	0:0	381:1809	5.0
Talladega N.F.							
Talladega R.D.	133	60:187	33:389	0:0	0:0	226:709	6.0
Shoal Creek R.D.	87	13:40	0:0	0:0	0:0	100:127	3.0
Oakmulgee R.D.	307	80:253	27:240	0:0	0:0	414:800	5.0
Tuskegee N.F.							
Tuskegee R.D.	7	0:0	0:0	0:0	0:0	7:7	0
TOTAL ALL DISTRICTS	808	347:1147	133:1356	7:334	0:0	1295:4026	0

^{1/} Expanded to 100% survey.

^{2/} Single trees not included.

Table 4. Comparison of spots and infested trees per M acres
host type from southern pine beetle evaluations
conducted in 1975 and 1974 on National Forests of
Alabama

Ownership	Spots/M acres host type		Infested trees/M acres host type	
	1975	1974	1975	1974
Bankhead N.F.				
Bankhead R.D.	1.5	.9	.2	1.0
Black Warrior R.D.	3.6	1.9	5.5	2.7
Talladega N.F.				
Talladega R.D.	2.3	4.5	1.8	5.9
Shoal Creek R.D.	1.0	1.2	.6	.6
Oakmulgee R.D.	1.9	2.7	.2	.8
Tuskegee N.F.				
Tuskegee R.D.	.7	6.4	<u>1/</u>	7.0

1/ Information not available.